Code No: R05220203   **R05**   **Set No. 2**

II B.Tech II Semester Examinations,November 2010
POWER SYSTEMS-I
Electrical And Electronics Engineering

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Write short notes on systems of AC distribution.

   (b) A single phase ring distributor ABC is fed at A. The loads at B and C are 20A at 0.8 p.f. lagging and 15A at 0.6 p.f. lagging respectively, both expressed with reference to the voltage at A. The total impedance of the three sections AB, BC and CA are $(1 + j1)$, $(1 + j2)$ and $(1 + j3)$ ohms respectively. Find the total current fed at A and the current in each section. [8+8]

2. (a) Distinguish between two part and three part tariffs.

   (b) A supply company offers the following alternate tariffs for supply to a factory

      i. HV supply at Rs. 70 per KVA per annum plus 3 paise per KWh
      ii. LV supply at Rs. 65 per KVA per annum plus 4 paise per KWh.

      The cost of transformers and switch gears for HV supply is Rs. 50 per KVA and full transformer losses are 2%. The annual fixed charges on the capital cost of HV plant are 15%. If the factory runs for 6 hours a day, find the number of days for which the factory should be run so that the HV supply is cheaper. [8+8]

3. What are the commercial types of reactors and explain the pressurized water reactor with schematic diagram? What are the advantages and disadvantages of it? [16]

4. (a) Draw a single line diagram showing a typical distribution system.

   (b) Two conductors of DC distributor cable AB, 1000m long have a total resistance of 0.1Ω. The ends A and B are fed at 240V. The cable is uniformly loaded at 0.5 A/m length and concentrated loads of 120A, 60A, 100A and 40A at points distant 200m, 400m, 700m and 900m respectively from the end A. Calculate

      i. the point of minimum potential
      ii. currents supplied from ends A and B
      iii. the value of minimum potential. [8+8]

5. (a) Why the improvement of power factor is very important for both consumers and generating stations? List the various causes of low power factor and explain.

   (b) A single-phase motor takes a current of 10 amps at a p.f. of 0.707 lagging from a 230 V, 50 Hz supply. What value must a shunting capacitor have to raise the p.f. to unity. [8+8]

6. (a) Define the load curve and illustrate it with different demands.

1

(b) A generating station supplies 4 feeders with the maximum demand (in MW) of 16 MW, 12 MW and 7 MW. The overall maximum demand on the station is 20MW and the annual load factor is 45%. Calculate the diversity factor and the number of units generated annually. [8+8]

7. (a) What are the factors to be considered for selecting location of substations?

(b) What are the merits and demerits of indoor substations over outdoor substations? [8+8]

8. Draw the neat schematic diagram of feed water / steam flow circuit of a modern thermal power plant showing the locations of low pressure feed water heater, decorating heater, high pressure feed water heater, super heater. State the functions of each equipment. [16]

⋆ ⋆ ⋆ ⋆ ⋆

2

Code No: R05220203 $\boxed{\textbf{R05}}$ $\boxed{\textbf{Set No. 4}}$

II B.Tech II Semester Examinations,November 2010
POWER SYSTEMS-I
Electrical And Electronics Engineering

Time: 3 hours Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Write short notes on systems of AC distribution.

   (b) A single phase ring distributor ABC is fed at A. The loads at B and C are 20A at 0.8 p.f. lagging and 15A at 0.6 p.f. lagging respectively, both expressed with reference to the voltage at A. The total impedance of the three sections AB, BC and CA are $(1 + j1)$, $(1 + j2)$ and $(1 + j3)$ ohms respectively. Find the total current fed at A and the current in each section. [8+8]

2. (a) Define the load curve and illustrate it with different demands.

   (b) A generating station supplies 4 feeders with the maximum demand (in MW) of 16 MW, 12 MW and 7 MW. The overall maximum demand on the station is 20MW and the annual load factor is 45%. Calculate the diversity factor and the number of units generated annually. [8+8]

3. (a) Why the improvement of power factor is very important for both consumers and generating stations? List the various causes of low power factor and explain.

   (b) A single-phase motor takes a current of 10 amps at a p.f. of 0.707 lagging from a 230 V, 50 Hz supply. What value must a shunting capacitor have to raise the p.f. to unity. [8+8]

4. What are the commercial types of reactors and explain the pressurized water reactor with schematic diagram? What are the advantages and disadvantages of it? [16]

5. (a) Distinguish between two part and three part tariffs.

   (b) A supply company offers the following alternate tariffs for supply to a factory

      i. HV supply at Rs. 70 per KVA per annum plus 3 paise per KWh.
      ii. LV supply at Rs. 65 per KVA per annum plus 4 paise per KWh.

   The cost of transformers and switch gears for HV supply is Rs. 50 per KVA and full transformer losses are 2%. The annual fixed charges on the capital cost of HV plant are 15%. If the factory runs for 6 hours a day, find the number of days for which the factory should be run so that the HV supply is cheaper. [8+8]

6. (a) What are the factors to be considered for selecting location of substations?

   (b) What are the merits and demerits of indoor substations over outdoor substations? [8+8]

3

R05 **Set No. 4**

7. (a) Draw a single line diagram showing a typical distribution system.

   (b) Two conductors of DC distributor cable AB, 1000m long have a total resistance of 0.1Ω. The ends A and B are fed at 240V. The cable is uniformly loaded at 0.5 A/m length and concentrated loads of 120A, 60A, 100A and 40A at points distant 200m, 400m, 700m and 900m respectively from the end A. Calculate

       i. the point of minimum potential

       ii. currents supplied from ends A and B

       iii. the value of minimum potential. [8+8]

8. Draw the neat schematic diagram of feed water / steam flow circuit of a modern thermal power plant showing the locations of low pressure feed water heater, decorating heater, high pressure feed water heater, super heater. State the functions of each equipment. [16]

⋆ ⋆ ⋆ ⋆ ⋆

4

Code No: R05220203 | **R05** | **Set No. 1**

II B.Tech II Semester Examinations,November 2010
POWER SYSTEMS-I
Electrical And Electronics Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Define the load curve and illustrate it with different demands.

   (b) A generating station supplies 4 feeders with the maximum demand (in MW) of 16 MW, 12 MW and 7 MW. The overall maximum demand on the station is 20MW and the annual load factor is 45%. Calculate the diversity factor and the number of units generated annually. [8+8]

2. Draw the neat schematic diagram of feed water / steam flow circuit of a modern thermal power plant showing the locations of low pressure feed water heater, decorating heater, high pressure feed water heater, super heater. State the functions of each equipment. [16]

3. (a) Write short notes on systems of AC distribution.

   (b) A single phase ring distributor ABC is fed at A. The loads at B and C are 20A at 0.8 p.f. lagging and 15A at 0.6 p.f. lagging respectively, both expressed with reference to the voltage at A. The total impedance of the three sections AB, BC and CA are (1 + j1), (1 + j2) and (1 + j3) ohms respectively. Find the total current fed at A and the current in each section. [8+8]

4. (a) Why the improvement of power factor is very important for both consumers and generating stations? List the various causes of low power factor and explain.

   (b) A single-phase motor takes a current of 10 amps at a p.f. of 0.707 lagging from a 230 V, 50 Hz supply. What value must a shunting capacitor have to raise the p.f. to unity. [8+8]

5. (a) Draw a single line diagram showing a typical distribution system.

   (b) Two conductors of DC distributor cable AB, 1000m long have a total resistance of 0.1Ω. The ends A and B are fed at 240V. The cable is uniformly loaded at 0.5 A/m length and concentrated loads of 120A, 60A, 100A and 40A at points distant 200m, 400m, 700m and 900m respectively from the end A. Calculate

      i. the point of minimum potential
      ii. currents supplied from ends A and B
      iii. the value of minimum potential. [8+8]

6. What are the commercial types of reactors and explain the pressurized water reactor with schematic diagram? What are the advantages and disadvantages of it? [16]

7. (a) Distinguish between two part and three part tariffs.

5

(b) A supply company offers the following alternate tariffs for supply to a factory

    i. HV supply at Rs. 70 per KVA per annum plus 3 paise per KWh

   ii. LV supply at Rs. 65 per KVA per annum plus 4 paise per KWh.

The cost of transformers and switch gears for HV supply is Rs. 50 per KVA and full transformer losses are 2%. The annual fixed charges on the capital cost of HV plant are 15%. If the factory runs for 6 hours a day, find the number of days for which the factory should be run so that the HV supply is cheaper. [8+8]

8. (a) What are the factors to be considered for selecting location of substations?

   (b) What are the merits and demerits of indoor substations over outdoor substations? [8+8]

⋆ ⋆ ⋆ ⋆ ⋆

6

II B.Tech II Semester Examinations,November 2010
POWER SYSTEMS-I
Electrical And Electronics Engineering

Time: 3 hours   Max Marks: 80
Answer any FIVE Questions
All Questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. What are the commercial types of reactors and explain the pressurized water reactor with schematic diagram? What are the advantages and disadvantages of it? [16]

2. (a) Write short notes on systems of AC distribution.

   (b) A single phase ring distributor ABC is fed at A. The loads at B and C are 20A at 0.8 p.f. lagging and 15A at 0.6 p.f. lagging respectively, both expressed with reference to the voltage at A. The total impedance of the three sections AB, BC and CA are (1 + j1), (1 + j2) and (1 + j3) ohms respectively. Find the total current fed at A and the current in each section. [8+8]

3. (a) Distinguish between two part and three part tariffs.

   (b) A supply company offers the following alternate tariffs for supply to a factory

      i. HV supply at Rs. 70 per KVA per annum plus 3 paise per KWh
      ii. LV supply at Rs. 65 per KVA per annum plus 4 paise per KWh.

   The cost of transformers and switch gears for HV supply is Rs. 50 per KVA and full transformer losses are 2%. The annual fixed charges on the capital cost of HV plant are 15%. If the factory runs for 6 hours a day, find the number of days for which the factory should be run so that the HV supply is cheaper. [8+8]

4. (a) What are the factors to be considered for selecting location of substations?

   (b) What are the merits and demerits of indoor substations over outdoor substations? [8+8]

5. Draw the neat schematic diagram of feed water / steam flow circuit of a modern thermal power plant showing the locations of low pressure feed water heater, decorating heater, high pressure feed water heater, super heater. State the functions of each equipment. [16]

6. (a) Why the improvement of power factor is very important for both consumers and generating stations? List the various causes of low power factor and explain.

   (b) A single-phase motor takes a current of 10 amps at a p.f. of 0.707 lagging from a 230 V, 50 Hz supply. What value must a shunting capacitor have to raise the p.f. to unity. [8+8]

7. (a) Draw a single line diagram showing a typical distribution system.

(b) Two conductors of DC distributor cable AB, 1000m long have a total resistance of 0.1Ω. The ends A and B are fed at 240V. The cable is uniformly loaded at 0.5 A/m length and concentrated loads of 120A, 60A, 100A and 40A at points distant 200m, 400m, 700m and 900m respectively from the end A. Calculate

  i. the point of minimum potential

  ii. currents supplied from ends A and B

  iii. the value of minimum potential. [8+8]

8. (a) Define the load curve and illustrate it with different demands.

(b) A generating station supplies 4 feeders with the maximum demand (in MW) of 16 MW, 12 MW and 7 MW. The overall maximum demand on the station is 20MW and the annual load factor is 45%. Calculate the diversity factor and the number of units generated annually. [8+8]

⋆⋆⋆⋆⋆